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GEOGRAPHICAL RECORD

AMERICAN GEOGRAPHICAL SOCIETY

Monthly Meeting of November. The regular monthly meeting of the American Geographical Society was held on Tuesday, November 21, at the Engineering Societies' Building, 29 West Thirty-ninth Street. President Greenough presided. The President congratulated the Society on the highly satisfactory response which had been received to the invitations to Fellowship in the Society extended to a selected list of people throughout the country instead of, as heretofore, chiefly to residents of New York and vicinity.

He thereupon submitted for confirmation the names of 1,118 candidates, each of whom had been approved by the Council, and they were confirmed by the meeting as Fellows of the Society.

The lecture for the evening was entitled ''Exploration in the Upper Amazonian Valley,'' by Harriet Chalmers Adams, F.R.G.S. Mrs. Adams gave a highly entertaining description, illustrated by exceptionally good lantern slides, of the eastern slopes of the Peruvian Andes and the adjacent plains, together with an account of experiences among the forest tribes of the region.

NORTH AMERICA

Conservation of Bird Life in North America. Since the commencement of reservation work by the National Association of Audubon Societies in 1902 the conservation of bird life has made great advancement in the United States. Its status was discussed by Dr. T. Gilbert Pearson in an address before the seventh annual meeting of the Conservation Commission of Canada (*Report of the Seventh Annual Meeting,* Montreal, 1916). Reservations now number about seventy. They are scattered over the country from the gull and tern refuges of the Maine coast to the egret asylums of Florida. Along the great migratory route of the Mississippi is a long line of them —the valley from St. Paul to Memphis, the sunken lands of Arkansas, and the swamps of Louisiana. But they also extend farther afield. In the Yukon delta is a reservation larger than the state of Connecticut. Another takes in the western group of Hawaiian Islands; it was raided by Japanese feather-hunters in 1915. The Pribilof Islands shelter birds as well as seals, and the latest and one of the most notable additions to the list is the Canal Zone, an important winter station for migratory birds from the United States. The society is carrying out a vigorous propaganda in Alaska, a region gaining in interest from the conservation point of view as Canada is pushing forward its northwestern frontier of civilization. Yet the Dominion, with vast stretches of land unfit for agriculture, has unusual opportunities for conservation. Of the regions particularly calling for the establishment of reservations is Labrador, where the decimation of bird life lamented by Audubon three-quarters of a century ago is still progressing.

Joint action between the Dominion and the United States will undoubtedly contribute to the progress of bird conservation on the continent as a whole, and it is satisfactory to note that the bird migration treaty pending between the two countries promises to be ratified before long.

The Correct Name of Lassen Peak. The recent eruptions of Lassen Peak (see in part R. S. Holway: Preliminary Report on the Recent Volcanic Activity of Lassen Peak, *Bull. Amer. Geogr. Soc.,* Vol. 46, 1914, pp. 740-755, reprinted from *Univ. of California Publs. in Geogr.*), have brought this most active and interesting volcano of the United States into the public eye. The newspaper despatches frequently refer to it as ''Mount Lassen,'' evidently in conformity with the names of other well-known peaks, such as Mount Shasta and Mount Rainier. The form ''Lassen Peak'' is, however, the one that has been in general use by scientific writers from the time of the Geological Survey of California under Professor J. D. Whitney in 1865 to the standard ''Geomorphic Map of California and Nevada'' published by the Earthquake Investigation Commission in 1908 (for comment, see *Bull. Amer. Geogr. Soc.,* Vol. 47, 1915, pp. 233-234). This usage was given official sanction by a decision of the U. S. Geographic Board on October 9, 1915. The same form occurs in the titles of two reserves previously created with the peak as a nucleus, the Lassen Peak National Forest and the Lassen Peak National Monument. The most recent creation, Lassen Volcanic National Park, omits the generic noun.

The peak and the adjoining county in California are named after Peter Lassen, a sturdy pioneer who guided many an early settler into the Sacramento Valley. A small crumbling monument thirty miles from the peak marks his last resting place. "In the early days of the Pacific Railroad surveys some pious monk called the peak St. Joseph's mountain, but the names Lassen's Peak and Lassen's Butte soon came into general use. Whitney has shown the inappropriateness of the French term *butte,* which, translated exactly, means knoll. As Lassen never owned the mountain, in later years the possessive form of the name was dropped," thus establishing the present form (*U. S. Geol. Survey Press Bull. No. 294*).

In this connection it may not be amiss to recall that Lassen Peak lies in the Cascade Range and not in the Sierra Nevada. Many general works of reference extend the Sierra Nevada northward to the Klamath River, to include Mount Shasta. This, however, is an arbitrary boundary. The dividing line between the volcano-topped Cascades and the tilted and complex fault-block, made up chiefly of ancient rocks, which constitutes the Sierra Nevada lies along the North Fork of the Feather River, as shown by Diller (*U. S. Geol. Survey 14th Annual Rept.,* Part II, Pl. 40).

Fog and Water Supply in California. A note by W. G. Reed (*Monthly Weather Rev.,* 1916, p. 288) calls attention to the importance of fog in providing moisture for vegetation in the California coast region in summer. The close relation between the occurrence of summer fog and the redwood is well known. Single trees, as on the Berkeley Hills of the Coast Ranges, drip with moisture during summer fogs. Although the ground away from the trees is dry, the grass under the trees is green, and the ground is moist to a considerable depth. R. DEC. WARD.

Revival of Iron Mining in the Adirondacks. The opening of the Champlain branch of the New York State Barge Canal and the reduction of freight charges by over 50 per cent should contribute much towards a revival of the mining industry of the eastern part of the state (Iron Ore Shipments from Lake Champlain, *Bull. Atlantic Waterways Assoc.,* Vol. 8, No. 6, Philadelphia, 1916). Up to 1906 the mines, worked almost continuously for over a century, had yielded a total output estimated at 35,000,000 long tons, of which amount more than a fifth was mined during the decade 1880 to 1890 (*New York State Museum Bull. 119,* Albany, 1908). The latter date marks the beginning of a period of depression accounted for in part by competition with Lake Superior ores. The Champlain deposits, however, are still productive, and the ore is of high grade, so that under improved conditions of transportation and with demand still active the anticipated revival is justified. To meet it Port Henry at the southern end of the lake is to be equipped with new docks of modern type, capable of handling an annual production of ore estimated at 1,500,000 tons.

SOUTH AMERICA

A New Theory of the Origin of the Chilean Nitrate Deposits. The paralysis of the Chilean nitrate industry during the first months of the war, followed by its no less remarkable recovery, has quickened economic interest in the deposits. Naturally enough comes a recrudescence of scientific interest, with another attempt to solve the vexed question of the origin of the deposits (The Genesis of the Chilean Nitrate Deposits, by J. T. Singewald, Jr., and B. L. Miller, *Economic Geology,* Vol. 11, 1916, No. 2). Unlike former theories the new one seeks to solve the problem of the genesis of the deposits through explanation of their localization. The deposits are limited to the western edge of the *pampa.* The prime causal agencies are the extreme aridity of the region and its peculiar hydrographic features. Although, with the single exception of the Loa, no surface stream reaches the sea between the Rio de Camarones (19° S.) and the Rio de Copiapó (27° S.), the underground water-supply is abundant. The water-table, following the trend of the topography but with less accentuated relief, comes very near the surface of the western edge of the *pampa.* In the *salar* of Lagunas, Tarapacá province, it is only three to three and a half feet from the surface—a circumstance which has proved highly advantageous for the production of pure salt (see "A Unique Salt Industry in Chile," by the same authors, listed in the June *Review,* p. 471). The porosity of the soil of the western *pampa* and the abnormal evaporation, combined with the convergence of ground water in depressions at very slight depths below the surface, cause high concentration of the mineral content of the water. In the most favorable places the degree of concentration becomes such that the more efflorescent salts tend to come out of solution and accumulate in the overlying soil. Where both common salt and nitrate have been deposited the latter naturally tends to effloresce round the edges of the depression: the typical *salar* of common salt is bordered by accumulations of nitrate. To this simple physical process some or all of those invoked by the earlier theories may have contributed. Atmospheric electricity in the High Andes is a possible agency for the production of nitrate from the air. The decomposition of guano, the nitrogenous source in the theory popularly explained by Tower (The Nitrate Fields of Chile, *Popular Science Monthly,* Vol. 83, 1913), is certainly a factor to a greater or lesser extent. The influence of nitrifying bacteria is rather more problematic. In this connection may be noted a report from the Peruvian School of Mines (Nitrate of Potash in Peru, *Commerce Repts.,* No. 110, Washington, 1916) on an occurrence of nitrate on the Peruvian coast between Pacasmayo and Huarmey. The deposit, of small extent, is of scientific rather than economic interest. The nitrate, existing as the potassium salt, is produced by bacteria and is chiefly remarkable for the rapidity of formation. The deposits have long been exploited by the natives as a source of material for the fire-crackers that are an essential adjunct to the Peruvian *fiesta.*

Professor Bingham's Peruvian Expedition of 1915. In the May issue of the *National Geographic Magazine* Professor Hiram Bingham relates some results of the 1915 Peruvian Expedition, whose successful completion has already been announced (*Bull. Amer. Geogr. Soc.,* Vol. 47, 1915, p. 774). The operations of the expedition were conducted in the same general region as before, i. e. in the basins of the Apurimac and Urubamba Rivers between latitudes 13°30′ (latitude of Cuzco) and 12°30′ S.

Within this territory was covered a considerable area of new ground connected more or less directly with Machu Picchu, a further study of which formed one of the major objectives of the expedition. The former importance of this frontier fortress was confirmed by the discovery of several new trails radiating from the city to various parts of the ancient Inca kingdom. Leaving the Urubamba some distance below Ollantaytambo, the headquarters of the 1915 expedition, a route was taken following the crest line of the Cordillera Vilcapampa and passing some of its most notable peaks—beautiful Salcantay (20,565 feet) of the many glaciers, Soray (19,435 feet), and Soiroccocha (18,197 feet), on whose flanks at an elevation of between 15,000 and 16,000 feet is located what Professor Bingham believes to be the loftiest ''forest'' (woodland) in the world.

After a descent to the Upper Vilcabamba valley the Cordillera was again traversed by a trail leading direct to Machu Picchu. It is perhaps the most interesting of the lost trails, for it connects the Urubamba fortress with Vitcos on the Vilcabamba, the refuge of the last of the Inca kings. Its course is shown on the route map of the expedition, which also contributes important new information on the hydrography of the region. The earlier expeditions had already proved the existing maps of the region to be seriously incorrect. Raimondi's map, for instance, greatly narrows the divide between the two major rivers and attributes certain tributaries of the Urubamba, notably the Pampaconas, to the Apurimac. A party from the expedition force followed the entire course of the San Miguel, a stream heretofore unmapped and known only to the ubiquitous rubber collector. This stream heads a little north of the Vilcabamba and, flowing in a northwesterly direction, unites with the Pampaconas to form the Cosireni, which in its turn enters the Urubamba at the great bend (see the map accompanying ''The Cañon of the Urubamba,'' by Isaiah Bowman, *Bull. Amer. Geogr. Soc.,* Vol. 44, 1912, No. 12). The party also penetrated a considerable distance up the Comberciato, a still larger tributary entering the Urubamba farther down-stream. Here they encountered members of the hunting and fishing tribe of Machigangas, with whose aid the naturalist secured many valuable specimens.

Machu Picchu itself afforded another fine hunting ground for the natural history collections, for it lies in the transition zone between the temperate and cold highlands and the tropical valleys and plains. Moreover the Urubamba valley forms a migratory route for the bird life of the country, and as many as eighty different ornithological species were noted in this single spot.

The botanical collection was also rich, particularly in food plants. Mr. O. F. Cook, the botanist of the expedition, gives some idea of their value in an article ''Staircase Farms of the Ancients'' following Professor Bingham's narration. He emphasizes the essentially agricultural foundation of Inca civilization, its antiquity and high development. On biological grounds he believes that most of the cultivated land was originally forested. Its removal must have entailed great labor, and, even when removed, the area at an elevation where agriculture was possible must have been small. Hence not only was the land carefully tilled, fertilized, and irrigated, but its extent was increased by a system of terrace cultivation the most remarkable in the world. The Peruvian plateau and its deep valleys embrace a complete range of climates, and vegetation and food resources are correspondingly varied within short distances. Hence it is not surprising that ''more plants appear to have been domesticated in the Peruvian region than in any other part of America.'' Probably the cultivated plants of the ancient Peruvians number some seventy or eighty species. For descriptive purposes their distribution is best classified primarily into the three altitudinal belts defined by the use of the predominant food plant: cassava or yuca up to 6,000 feet; maize between 6,000 feet and 11,000 feet; and potatoes from 11,000 feet to the limits of cultivation, over 14,000 feet. The dominant plants of the two latter zones are remarkable for the number of varieties they include, a fact confirming the antiquity of cultivation. Practical interest also attaches to them in respect of the possibilities they present for introduction into the United States. Experiments to this end have been carried out and have proved successful. Last year corn from Cuzco planted on the coast of southern California matured seed where varieties from the corn belt states have failed. The wide altitudinal range of the Andean varieties—Titicaca corn grows at an elevation of nearly 13,000 feet—suggests possibilities of extending the limits of corn cultivation in the United States.

The expedition also continued its anthropological studies. Using the Hrdlička method, 153 Quechua Indians, 90 men and 63 women, were measured and the majority of them photographed. Many other new photographs, some of which illustrate Professor Bingham's and Mr. Cook's articles, add to the importance of the former's unique collection.

New Expedition of Dr. Hamilton Rice to the Northwestern Amazon Basin. Dr. Hamilton Rice, well known for his surveys of the headwater rivers in the Amazon-Orinoco divide region, sailed on November 15 from New York on an expedition to the same area. Doctor Rice proceeded on the *Alberta,* a steam yacht chartered for the occasion, and expects to reach Santa Isabel on the Rio Negro. Using this town as a base he intends to push up the various tributaries as far as possible in a launch which has been especially constructed for this purpose. She is forty feet long and draws only two and one-half feet of water. With a fuel capacity of 700 gallons and a maximum horsepower of 100, she has a cruising radius of more than 1,000 miles, assuming a speed of twelve miles an hour. Doctor Rice's specific field of exploration will probably be the region between the Uaupés and the Inirida Rivers within which only the Içana River has been surveyed, by himself in 1912-13 (see map in *Geogr. Journ.,* August, 1914). Doctor Rice is accompanied on the expedition, which is to last about six months, by Dr. William T. Councilman, professor of pathology at Harvard University; by Ernest Howe, lately of the U. S. Geological Survey, as geologist; and by Earl E. Church of the U. S. Coast and Geodetic Survey, as topographer. The *Alberta* is especially screened against insects and is equipped with a wireless outfit.

Japanese Labor for Brazil. During the last decade Japanese immigration has been favored by the government of Brazil, and several measures have been adopted to deflect such a labor current to the rice fields and coffee plantations of São Paulo and adjacent states. The most recent activity reported is an agreement with a Japanese emigration company for the transport of 20,000 Japanese within a period of two years. The emigrants will be farm laborers and will engage in the cultivation of rice, beans, and coffee. A new steamship line to be inaugurated between the two countries will accommodate the emigrant traffic. Its first sailing is announced for February, 1917 (*Commerce Repts.,* Nos. 264, 265, 1916).

New Steamship Service between Argentina and Bolivia. The November issue of the *Boletín de la Unión Panamericana* reports the initiation of a new line of river steamers putting Rosario, Argentina, into direct communication with the Bolivian port of Puerto Suârez, 1,800 miles distant up the Paraguay. Thus ocean-borne freight destined for Bolivia is transshipped only at Rosario, whereas under former conditions change had to be made at Asunción and frequently at other river ports as well.

EUROPE

Italy and the Adriatic. The Italian point of view of the Adriatic question is set forth under this title by Dr. M. I. Newbigin in the October, 1916, issue of the *Scottish Geographical Magazine* (pp. 466-477). The article, which was originally read before the section of geography at the Newcastle meeting of the British Association in September, 1916, thus presents the opposite side of the case from that taken up by Sir Arthur Evans in "The Adriatic Slavs and the Overland Route to Constantinople" (*Geogr. Journ.,* April, 1916). It is an instructive summary of the essential geographical facts affecting the destiny of the Adriatic region. The easterly seaward extension of the alluvial plains of northern Italy and the increasing shallowness of their ports are seriously hampering Italy's economic development. The lack of deep-water harbors is a check to the free and full exploitation of the resources of the plains. Ravenna and Aquileia have lost their former importance, while Venice is beset by natural drawbacks which make the navigator shun its approaches. As Doctor Newbigin tersely expresses it, "the hiatus between the railway terminus and the harbor at Venice is symbolic for the whole region."

A marked improvement in this condition is observable as soon as the Austrian sections of the Adriatic area are attained. Here, however, a different set of difficulties has to be faced on account of the mountains which isolate the narrow coastland from its natural rearland. Nevertheless, from Trieste southward along the eastern Adriatic to the Albanian frontier there are found harbors that are deep and commodious. Beyond, the question of Valona is of vital importance to Italian interests. The seaport commands the entrance to the Adriatic. Italy, preparing herself to enter the ranks of industrial nations, is taking stock of her assets. In this, Italian leaders have realized that nature has dealt somewhat stingily with their country. Their endeavor to change its political geography is their bid for betterment.

Has Climate "Changed" within Historic Times in Europe? The subject of possible "climatic" changes within historic times continues to attract the attention of many writers. Dr. H. H. Hildebrandsson, the well-known Swedish meteorologist, has recently read a paper on this question before the Royal Society of Sciences of Upsala (translated in *Monthly Weather Rev.*, 1916, pp. 344-352), which is of rather unusual interest, both because of the prominence of the author and because of the clean-cut conclusions which are reached. The "stock" available evidence is taken up, and under each heading the results of Doctor Hildebrandsson's study are briefly stated. The scope of the inquiry is limited to Europe, and the question is not one of oscillations or periodicities but of permanent change.

The non-instrumental evidence is first considered. In Palestine, the culture of the date and of the vine are practiced today as of old. In Italy the laurel and the myrtle and the vine and the fir grow under the same conditions as in the days of Pliny, of Varro, and of Virgil. Hence the conclusion that the climate of Rome is essentially the same now as at the beginning of the Christian era. J. W. Gregory, Partsch, and others have reached the same result regarding conditions in Cyrenaica and Tunisia. The dates of the vintage and the localities and methods of grape culture in France, as determined by a record of ten centuries, indicate that the climate has not changed appreciably. Grapes were cultivated and wine used to be made at isolated localities in Great Britain, and under special conditions, as might be the case today if such industry were profitable. The dates of the opening and closing of lakes and rivers in Sweden and in Russia have been kept, as a complete series, from early in the eighteenth century and in one case from 1530 (with some breaks). The evidence is that spring comes in the Baltic region at the same time, on the average, as it did early in the sixteenth century. The supposed changes in the climate of Iceland, based on botanical evidence and often referred to, have been shown by Professor Th. Thoroddsen, the leading authority on Iceland, to have been the results of economic and political causes. Fossil trees found in the peat bogs are as small as those growing today, and the most ancient Icelandic saga speaks of people going to Norway for wood to be used in building.

A catalogue of severe winters in Danish waters goes back as a complete series to 1750, and as a broken series to the eleventh century. A study of these dates and of other available facts has led Speerschneider and Norlind to the conclusion that there the climate of the Middle Ages was sensibly the same as that of today. In 1582 to 1597, Tycho Brahe kept his famous non-instrumental meteorological journal on the island of Hven. This journal has been studied by Paul la Cour and by Ekholm and compared with modern instrumental records. Paul la Cour found a difference between the wind directions of 1582-1597 and those of today, and Ekholm concluded that the winters were colder then. Hildebrandsson concludes that the winters were colder during that particular period, but that this result does not justify us in assuming that the winters of that century were *as a rule* colder than the present one. Regarding the Alpine glaciers, the well-known views of Heim are quoted.

Doctor Hildebrandsson's conclusion is clearly stated, as follows: "There exist everywhere climatic variations of long and short duration, but it is not possible to prove that the climate of Europe has changed for either better or worse during historic times." The results of Professor J. W. Gregory's recent study of this same subject led him to a very similar conclusion, viz., "in historic times there has been no world-wide change of climate."

R. DeC. Ward.

The Southwesternmost Black Soils of Europe. Writing in the geological series of the *Trabajos del Museo Nacional de Ciencias Naturales* of Madrid (No. 13, 1915), E. Hernândez-Pacheco discusses the age and origin of the "black lands" of southernmost Spain. They lie between Cadiz and Gibraltar, in the Janda depression, a tectonic feature due to a twin system of fractures running at right angles to each other. This bowl-shaped depression has a flat bottom lying at about sea-level and practically lacking an outlet. The shallow lagoon formed in the site during each winter season dwindles away in the summer months, leaving a black residue presenting great resemblance to the well-known *chernoziom* of southern Russia or the *tirz* of western Morocco (see also ''Las Tierras Negras de Marruecos,'' by Juan Dantin, in the same publication).

As far as known, these black soils, whether in Spain or Morocco, were formed under climatic conditions which are no longer prevailing. The black color is attributed to a carbonaceous humus generated during the decomposition of profuse vegetation growing under conditions of excessive humidity. The climate of the period of formation varied probably from temperate to cold, a characteristic of the Quaternary glacial epochs in certain regions of southern Europe. These deposits may be correlated chronologically with the loess of northern Europe and of Asia.

The uppermost layers of this black soil contain abundant relics of the Stone Age industries in the shape of quartzite and flint instruments, some of which undoubtedly belong to the Musterian, while others are probably of the Chellean type. These cultural deposits surround the plain of Janda and give evidence of the upper age limit of the black earth deposits.

The Export of Newfoundland Herrings to France. A relaxation of the ''Bait Act'' is enabling the export of several thousands of barrels of herrings from Newfoundland to France, where a serious shortage has been experienced in consequence of the war. This step on the part of the Newfoundland government expresses a relation new in the history of the Grand Banks fisheries, notorious for the clashing of French and British interests. The Bait Act was itself an outcome of the opposed interests. It was passed in 1886 to prohibit the sale of bait to the fishers of St. Pierre, who, aided by the high bounty awarded by the French government, could everywhere undersell the Newfoundland cod on the European markets (Round the Empire Notes, *United Empire,* N. S., Vol. 7, 1916, No. 8).

ASIA

Rainfall of China. Mr. Co-Ching Chu, a student in the Graduate School of Harvard University, has constructed a new rainfall map of China, based on data for 44 stations for the period 1900-1911 (*Monthly Weather Rev.,* 1916, pp. 276-281). Where the records do not cover this interval they have been reduced to it by comparison with neighboring stations. Three rainfall districts are noted. First, North China, with mean annual amounts of 20-40 inches (50-100 cms.). More than 60 per cent of the rain falls in the three summer months, with a maximum in July or August and a minimum in February. Second, the Yangtze Valley, with mean annual rainfalls between 40 and 60 inches (100-150 cms.), decreasing very gradually from the coast inland. Winter rains are more abundant than in northern or in southern China, although the amounts are small. July brings the maximum at most stations, and December the minimum. Third, South China, with mean annuals between 60 and 80 inches (150-200 cms.) along the coast, and 40 to 60 inches (100-150 cms.) inland. The percentages of rainfall in summer increase again in this district. June, or sometimes August, brings the maximum monthly rainfall. The control of the rainfall by various types of storms and by wind directions is considered. In northern China the precipitation of winter (December to February) is all in the form of snow; in central China it is partly rain. Snow is rare at Canton and Hongkong. R. DEC. WARD.

Railroads in Siam. Progress in the construction of Siamese railroads foreshadows the establishment of a rapid land route between the Gulf of Bengal and the China Sea. As soon as the Siamese railroads become linked with the systems in China and Indo-China an overland short-cut will become available and the long voyage around Singapore may be avoided.

The first railroad in Siam was opened in 1897 and ran between Bangkok and Ayuthia, the old capital (*Suppl. to Commerce Repts. No. 58a,* Nov. 6, 1916). This, the northern part of the system, has steadily been extended up the valley of the Menam River and beyond, where it now reaches Lampang, on the upper Meping, a western tributary of the Menam. The short distance to Chiengmai, the northern capital, will be completed before long. The region to be tapped here is rich in natural resources. With adequate transportation its products will find a ready market in Bangkok. The southern part of the system embraces the coastal districts of the Gulf of Siam. Of a total of 470 miles, 120 miles were in operation on April 1, 1915. Its most important section will eventually run along the whole length of the Malay Peninsula.

Two Siberian Expeditions. The Sayan expedition, which returned in the early part of the year, has made a study of economic conditions in the fur-producing region of the upper Yenisei (*Russian Suppl. of the London Times,* April 29, 1916). The expedition was organized by the Department of Agriculture and conducted by the game specialist and Asiatic explorer D. K. Soloviev. It represents another measure on the part of the Russian government for the protection of an industry seriously threatened with extinction. In particular, apprehension has been felt for the sable trade, reduced of late to one-sixth of its former dimensions. In 1912 a prohibition of the hunt was extended to Siberia for a term originally planned for three years, but the expedition considers necessary a renewal of the law for an equal length of time. The active measures of the expedition embrace the creation of two warrens, the Sayan of about 630,000 desiatims (1,700,000 acres) and the Kazyr-Suk of about 120,000 desiatims (324,000 acres).

Successful results were also obtained by the Yablonovyi expedition despatched by the Academy of Science in the summer of 1914 under the leadership of V. Ch. Dorogostaiski. Explorations were carried out in the central portion of the Yablonovyi Range, a region occupied by Yakuts and Orochones, the latter a Tungusic tribe described by M. A. Czaplicka in her ''Aboriginal Siberia.'' The expedition achieved its main objective in the collection of valuable specimens of the alpine fauna, including the local mountain sheep heretofore unknown in the European museums (*Russian Suppl. of the London Times,* same date).

POLAR REGIONS

Survey of the Newly Discovered Land by Stefansson. The latest advices received from Stefansson direct, a letter published in the *New York Times* of November 15, report that the survey has been begun of the new land discovered in June, 1915, north of Prince Patrick Island, the northwesternmost of the hitherto known islands of the American Arctic Archipelago (*Bull. Amer. Geogr. Soc.,* Oct., 1915, pp. 766-769, with map). The letter was sent from 78° N. and 116° W., a position corresponding to the southern edge of the new land; it is undated, but from internal evidence it seems to have been written about May, 1916. From hills a thousand feet high inland from Cape Murray (evidently the name given to a cape on the southern coast of the new land), Stefansson says that a water sky could be seen trending first north-northeast for 10 miles and then northwest for 30 miles. The presumption is that the coast has a similar trend, although the actual line could not be distinguished because it was low and covered by snow. On the day of writing a support party consisting of Storkersen, Thomsen, Kilian, and Illum was to return. An advance party consisting of Castle, Noice, and Andersen had left Cape Murray the day before, following the coast north. Stefansson himself was to follow in two days with two Eskimos. This in spite of the fact that he had sprained an ankle so badly about a week before that he did not expect to be able to walk for some weeks. At the time of writing he reported that he was riding with his foot strapped to a board and leaving the sled only occasionally to take compass bearings. Although annoying, he did not consider the accident serious. The men and dogs were living mainly on game, which was abundant. In case this source of supply should diminish, he reports having on hand about a thousand pounds of food and two hundred pounds of kerosene.

Stefansson expected to return by July 20 to the northern end of Melville Island, unless the new land proved extensive, in which case he planned to spend the summer there. The *Polar Bear,* which had been wintering in Prince of Wales Strait, between Banks and Victoria Islands, as already reported on his return by Doctor Anderson, the leader of the southern division of the expedition (September *Review,* p. 233), had orders to meet Stefansson and the new-land party at Melville Island in August, to winter there. Storkersen, with three Eskimos' families, was to spend the summer drying meat and skins in Melville Island for food and clothing for the next spring's trips, in case the *Polar Bear* should not reach Melville Island or should be wrecked.

Several other letters recently received from Stefansson give details with regard to the activities of the expedition since August, 1915, the latest date dealt with in the last communication previously received from Stefansson himself. In September, according to a letter dated Banks Island, January 15, 1916 (*New York Times,* Nov. 15), a party was sent out to survey as much as possible of the gap left in the northeastern coast of Victoria Island between Wynniatt's survey of 1851 and Hansen's of 1905. The supporting party returned safely to the *Polar Bear* on November 2, having left Storkersen, who was in charge of the survey, in good health at Hornby Point, almost as far as Wynniatt's farthest, on October 24. Storkersen expected to advance ten days farther and consequently had not returned on November 16, when Stefansson left for the Cape Kellett base on the southwestern corner of Banks Island.

Another detail is contained in a letter written at Cape Kellett on December 23, 1915, to Dr. H. J. Spinden of the American Museum of Natural History (*New York World,* Nov. 21). It says that an unfortunate falling out occurred with the "blond" Eskimos of Stefansson's previous expedition. The captain of the *Polar Bear,* whom Stefansson had sent to Minto Inlet, where they were, treated them as inferior beings. This they resented. Complications ensued which resulted in their stripping the captain's party of all they had, down to their drinking cups and plates. To make matters worse, the Eskimos contracted influenza and, when last heard from, were on the verge of starvation because illness had prevented hunting. Their troubles they ascribed to the white man's witchcraft. Should death among them occur either from disease or starvation, Stefansson writes, the break will be serious. At the time they professed great friendliness for Stefansson personally, but, even so, the changed circumstances made inadvisable a sojourn with them which Stefansson had planned.

At present the prospects are that Stefansson will not return until the fall of 1917. In a long letter to Rear Admiral Peary, dated Cape Kellett, January 11, 1916 (*New York Times,* Nov. 23), in which he outlined his plans, he says he still adheres to the original purpose of the expedition, the search for land north and west of the known extent of the Arctic Archipelago. He now places himself the limits of 83° N. and 45° W. Only in case no news of him is received by the spring of 1918 should a relief expedition be sent. But in general he urges that no anxiety be felt for him and pleads that more confidence be placed in his ability to take care of himself than was done during his previous silence.

In this connection it is worth noting that a correct map of Stefansson's routes in 1914-15 has appeared with the official account of the expedition (*Report of the Dept. of the Naval Service for the Fiscal Year Ending March 31, 1916,* pp. 71-80, Ottawa, 1916). It does not differ materially from the map published in the *Bulletin of the American Geographical Society* for October, 1915 (p. 767), which was based on the newspaper account of the trip.

Present Condition of the Crocker Land Expedition. The Acting Chairman of the Committee in Charge has sent to the Society the following latest information concerning the Crocker Land Expedition. According to a cablegram received from Copenhagen on November 15, 1916, the steamer *Danmark,* which was chartered by the committee for the relief of Doctor Hovey and the members of the expedition in north Greenland, was observed in Melville Bay on August 20, 1916, bound northward. From this report it would appear that the steamer had made only 150 miles northward in seventeen days, since previous advices reported her as being off Upernivik on August 3, 1916. This report and her failure to arrive either at Sydney or St. John's indicate that the ice conditions are severe and that the vessel has probably been delayed by ice on her southward voyage. It is still possible that the *Danmark* may reach this country before the end of the year, but even should she be caught in the ice and be compelled to winter in the north no anxiety need be felt for the safety of the party, as the vessel is staunch, well equipped, and well provisioned.

The first relief ship, the *George B. Cluett,* left its winter quarters in North Star Bay the latter part of July and arrived at Battle Harbor, Labrador, on September 7, 1916. She brought out a letter from Doctor Hovey, dated July 10, 1916, stating that he was in touch with Mr. Rasmussen, that the members of the Crocker Land Expedition were well, that Mr. MacMillan had returned to Etah on May 6, 1916, from his 1,500-mile sledge journey to the westward, and that all were looking forward to the arrival of the second relief ship, the *Danmark.*

OCEANS

The Drift of Mines at Sea. A year after the siege of Port Arthur a Japanese steamer nearing Honolulu struck a mine which had traveled more than half the distance across the Pacific. This is one of several cases going to prove that dangers to navigation from derelict mines are by no means impossible. In a paper contributed to *La Nature* for May 27, 1916, Professor Alphonse Berget calls attention to future perils from this source. Basing his argument on a study of currents, the eminent oceanographer finds that vessels will run greater risks in the waters of the neutrals of the present war than in those of the belligerents.

The displacement of floating mines from the area in which they have been strewn is caused by currents. A study of conditions in the Atlantic Ocean shows that floating mines will be liable to drift in a northeasterly direction and that they will eventually attain the coasts of Holland, Germany, Denmark, and Norway. Should any of these floating weapons be caught by the "Irminger Current"—a northeasterly offshoot of the Gulf Stream which sweeps counterclockwise past Iceland and swings around the southern end of Greenland, finally to merge with the Labrador Current—they might reach the east coast of North America.

In the Gulf of Gascony, an easterly branch of the Gulf Stream sweeps southward along the coasts of La Vendée and the *département* of Landes, after which it continues its course along western Spain. According to investigations undertaken in 1901 under the direction of Prince Albert of Monaco, it was found that floating objects deposited in the Gulf of Gascony eventually reached the northwestern shores of Spain and the northern reaches of the Portuguese coast.

In the Baltic the danger will be greatest along the Swedish coast. The twin system of currents peculiar to this sea consists of a stream proceeding from the North Sea along the Jutland coast into the Skagerak. A counter current along the Norwegian coast empties its waters into the North Sea. In the inner stretches of the Baltic the easterly flow of water is represented by a current along the German coast and northward. A southerly stream washes the Swedish shore.

In the Mediterranean the development of currents is comparatively feeble. The most significant in this connection is that which, traversing the mine-strewn Dardanelles, carries the superficial waters of the Black Sea to the Austrian side of the Adriatic.

WORLD AS A WHOLE AND LARGER PARTS

Proposed New Railroads in the Russian Empire. The remarkable progress of Russian railroad building since the outbreak of the war is an indication of the country's awakening to its industrial needs. Under the title of "Russia's War-Time Outlets to the Sea," an account of the first great stride made to promote Russian transportation facilities was given in the February number of the *Review*. Later advices show that the Russians' eagerness to equip their country with a convenient network of tracks has not abated.

One of the projected railroads is the White Sea-Ural-Ob River line. From Archangel, proceeding east-southeast by way of Pinega, the middle reaches of the Mezen River, and the Ukhtinsky district on the upper Ishma (63° N. and 54° W.), the line will cross the Pechora River at Troitzko-Pechorsk, continue across the Urals, and reach the Ob River at its westernmost bend near the Chemashevsky settlement (63° N.). A southward branch will be built along the eastern foot of the Urals to the station Nadezhdinsky Zavód of the Bogoslovsky railway, a northward branch of the trunk line from Petrograd to Siberia, which it joins at Yekaterinburg. The new line, whose total length will be about 1,000 miles, will thus become continuous with the main Russian system. It will open up districts rich in natural resources: the dense forests of the Mezen, Pechora, and Ob basins and the iron ore and mineral fuel of the eastern slope of the Urals. Besides, Siberian exports, chiefly grain, will be provided with a new outlet.

Other schemes to provide Siberia with new railways are noted in the July, 1916, issue of the *Scottish Geographical Magazine,* which reproduces in abstract form an article and its accompanying map from the *London Times Russian Supplement* for May 27, 1916. New lines are proposed to connect the Lena gold district and the Vitimsk mining area with the Trans-Siberian railway. Out of various proposals, the construction of a line between Tulun, a small station 170 miles west of Irkutsk, and Ust-Kut on the Lena has been selected, and it is expected that the completed line will be prolonged to Bodaïbo, northeast of Lake Baikal, although the method of reaching this terminal directly from Irkutsk by way of Kunerma also finds favor. Minerals and timber abound in this region. Another scheme is in consideration to connect the Kuznetsk coalfields, on the upper Tom south of Tomsk, with the main line at Sudjenka. From this coal basin the line might be extended westward with advantage to Barnaul, in the center of a rich agricultural and cattle-raising district.

In the Far East, Manchuria is to be provided with about 650 miles of new railways (*Far Eastern Review,* April, 1916). An agreement was signed on March 27, 1916, between Russia and China for the construction of a railway to connect the Chinese section of the Trans-Siberian railway (known as the Chinese Eastern Railway) at Tsitsikar with the Amur at Aigun. The line will be continued a short distance upstream in order to end opposite Blagovyeshchensk, the present terminus of the Amur Railway, to which reference was made in the June *Review* (under "Siberian Traffic Problems," p. 461). From Mergen, halfway between Tsitsikar and Aigun, a branch will be run to Kharbin. These new lines will widen the range of the colonization set afoot by the construction of the Chinese Eastern Railway. Chinese settlers followed quickly in the wake of this line, and it is expected that the same migration will be continued. The better agricultural lands lie southeast of Mergen, near the Sungari River and its affluents, the Hulan and Tunkan. Northward, agriculture yields in importance to forestry and mining.

All these activities are not confined to Russia's ante-bellum domain, as may be gathered from a recent decision of the government to extend the Caucasus railroads from Batum to Trebizond. The *Board of Trade Journal* for October 12, 1916, states that the connecting line will be of the ordinary Russian broad-gage type and that it will be constructed close to the Black Sea coast, so as to avoid the ranges forming the background of this body of water. It is expected that this line will be completed by the summer of 1917.

Rainfall Correlation between North and South America. Mr. H. H. Clayton, of the Argentine Meteorological Office, has made a comparison between the rainfall of the United States (long. 80° W.-110° W.), the annual stages of the Paraná River, and the rainfall of Australia (inverted). The correlation appears to be very close and is probably associated with correlations of temperature found by Mossman and Arctowski in the southern hemisphere. The temperature curves of Alice Springs, Australia, and Córdoba, Argentina, are closely similar to the rainfall and Paraná River curves, and the Arequipa, Peru, temperature curve also furnishes some interesting analogies (*Monthly Weather Rev.*, 1916, pp. 200-201). R. DeC. Ward.

PHYSICAL GEOGRAPHY

A New Experiment on the Strength of the Earth's Crust. The construction of a great irrigation reservoir by the government of New South Wales is affording the geophysicist an unusual opportunity for experiment (Some Geophysical Observations at Burrinjuck, by L. A. Cotton, *Journ. and Proc. Royal Soc. of New South Wales*, Vol. 49, Pt. 3, 1915). The reservoir in question, at Burrinjuck on the Murrumbidgee, is to have a height of 236 feet and a water storage capacity of 30,000,000,000 cubic feet. The weight of such a mass of water must exert a strain upon the contiguous crust. It is this effect that is being investigated. Three pendulums, two of them the instruments used by Hecker and Schweydar in their famous experiments on earth-tides, have been installed in shafts in the steep hillsides enclosing the reservoir. At the time of publication they had been recording satisfactorily for the greater part of a year. In addition to earth-tide, earthquake, and fault movements, they have recorded movements of specific interest to the investigators—slow deflections from the vertical apparently related to the action of the water load. The cause of these movements cannot yet be stated. Local isostatic adjustment and resiliency of the crust have been suggested, but a conclusive opinion must rest on further quantitative evidence.

"Sleet." The Weather Bureau has recently carried on a considerable correspondence in an endeavor to ascertain what meanings are associated with the term *sleet*, with a view to the adoption of a suitable ''official'' definition. The result of this investigation is that the definition adopted in 1897 is adhered to, viz., ''Only the precipitation that occurs in the form of frozen or partly frozen rain shall be called sleet.'' For the icy coating which is formed by the freezing of rain on cold objects near the earth's surface, the term ''ice storm'' is rejected and the term *glaze* is adopted. This is the equivalent of the English ''glazed frost,'' the French ''verglas,'' and the German ''Glatteis'' (*Monthly Weather Rev.*, 1916, pp. 281-286). R. DeC. Ward.

GEOGRAPHICAL NEWS

Captain Amundsen's Visit to This Country. Captain Roald Amundsen arrived in New York on November 27 on the *Frederik VIII* from Copenhagen. One of the purposes of his trip is to purchase an aeroplane for his projected North Polar trip. Details as to this expedition and its postponement were published at the time (*Bull. Amer. Geogr. Soc.*, Vol. 45, 1913, p. 618, and Vol. 46, 1914, pp. 532-533). The voyage is to be essentially a repetition of Nansen's drift in the *Fram*, amplified, however, by our increased knowledge of Arctic meteorology and oceanography. The recent newspaper accounts (e. g. *New York Times*, November 28) quote Amundsen as planning to begin his drift from the easternmost attainable point off the coast of Siberia. His original plan was to start from Bering Strait in order that the drift might carry him nearer to the pole than it did Nansen (Die Probleme des Nordpolarbeckens: Aufgaben und Plan einer neuen ''Fram''-Expedition, *Internatl. Rev. der gesamten Hydrobiol. und Hydrogr.*, Vol. 1, 1908, pp. 753-771). The point of emergence from the Polar Basin is expected to be between Greenland and Spitzbergen. Amundsen now hopes to be able to leave Norway in July, 1918. The aeroplane would be used for side excursions from the ship, including one to the pole.

PERSONAL

DR. J. G. ANDERSSON, formerly chief of the Geological Survey of Sweden, has been appointed by the Chinese government as the head of a geological survey.

DR. J. ERNEST CARMAN of the University of Cincinnati has been appointed to the chair of geology at the Ohio State University vacant by the death of Professor Charles S. Prosser.

PROFESSOR FREDERICK EHRENFELD of the University of Pennsylvania conducted a conference on ''Factors in the Lowering of the Land Surface'' at the Brooklyn Institute of Arts and Sciences on November 18.

PROFESSOR E. DE MARTONNE, Visiting French Professor at Columbia University, read a paper on ''The Limestone Plateaus of the Causses, Southern France'' before the New York Academy of Sciences on November 20.

SIR ERNEST SHACKLETON arrived in New Orleans on November 3 from Colon and departed immediately for San Francisco on his way to rescue the ten members of his expedition marooned on the Ross Sea side of the Antarctic continent. On November 8 he sailed from San Francisco for Wellington, New Zealand, where he and the rescue expedition expected to sail for the Antarctic on the *Aurora*.

OBITUARY

PROFESSOR MAURYCY RUDZKI, since 1902 director of the Cracow Observatory, has died at the age of 54 years. Professor Rudzki is best known to geographers for his ''Physik der Erde,'' Leipzig, 1911.